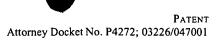What is claimed is:

1.   1.   A method of improving prediction accuracy of a branch prediction scheme,

2.   comprising:

3.   reading an individual instruction in a current set of instructions;

4.   fetching the individual instruction when an instruction fetch unit

5.   determines that the individual instruction is valid; and

6.   allowing the instruction fetch unit to use an index address for the fetched

7.   individual instruction.

1.   2.   The method of claim 1, wherein the individual instruction is a branch instruction,

2.   the method further comprising:

3.   determining whether the branch instruction has been read in a previous set

4.   of instructions.

1.   3.   The method of claim 2, further comprising:

2.   selectively using a fetch bundle address for a plurality of fetched

3.   individual instructions as the index address for the branch

4.   instruction based on whether the branch instruction has been read

5.   in the previous set of instructions.

1.   4.   The method of claim 2, further comprising:

2.   determining a proper index address to use if the branch instruction has

3.   been read in the previous set of instructions.

1.   5.   The method of claim 4, further comprising:

2.   determining the proper index address by determining the fetch bundle

3.   address the branch instruction would have used if a prior branch

4.   instruction in the previous set of instructions had not been

5.   mispredicted.

1   6.   The method of claim 1, wherein the branch prediction scheme is for predicting an

2   outcome of a branch instruction.

1   7.   The method of claim 1, wherein the index address is used to index an entry in a

2   branch prediction structure.

1   8.   The method of claim 3, wherein the fetch bundle address is an address of a first

2   instruction in the plurality of fetched individual instructions.

1   9.   The method of claim 1, wherein the plurality of fetched individual instructions is

2   an instruction fetch bundle.

1   10.   The method of claim 1, further comprising:

2   using decode information for the individual instruction to determine

3   whether the individual instruction is a branch instruction.

1   11.   The method of claim 1, further comprising:

2   using pre-decode information for the individual instruction to determine

3   whether the individual instruction is a branch instruction.

1   12.   A method of improving branch prediction accuracy, comprising:

2   receiving a set of instructions having an assigned address;

3   making a prediction for a branch instruction in the set of instructions using

4   the assigned address; and

5   retaining the assigned address for the branch instruction in the set of

6   instructions.

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1   13.   The method of claim 12 further comprising:

2   making a prediction for an other branch instruction in the set of

3   instructions using the assigned address; and

4   retaining the assigned address for the other branch instruction in the set of

5   instructions.

1   14.   The method of claim 12, wherein the assigned address is a fetch bundle address.

1   15.   The method of claim 13, wherein the branch instruction is mispredicted, the

2   method further comprising:

3   removing the set of instructions having the assigned address;

4   receiving a second set of instructions having a second assigned address;

5   recognizing a branch instruction in the second set of instruction as a

6   branch instruction in the removed set of instructions; and

7   making a prediction for the recognized branch instruction using the

8   assigned address of the removed set of instructions.

1   16.   A tool for improving prediction accuracy of a branch prediction scheme,

2   comprising:

3   a processor for reading an individual instruction in a current set of

4   instructions; and

5   an instruction fetch unit for determining whether the individual instruction

6   is valid and fetching the individual instruction when the individual

7   instruction is valid,

8   wherein an index address is used for the fetched individual instruction.

1   17.   The tool of claim 16, wherein the individual instruction is a branch instruction,

2   and the instruction fetch unit is further for determining whether the branch

3   instruction has been read in a previous set of instructions.

1 18. The tool of claim 17, further comprising:

2   a fetch bundle address for a plurality of fetched individual instructions,

3   wherein the fetch bundle address is selectively used as the index address

4   for the branch instruction based on whether the branch instruction

5   has been read in the previous set of instructions.

1 19. The tool of claim 17, further comprising:

2   a proper index address is used if the branch instruction has been read in

3   the previous set of instructions.

1 20. The tool of claim 19, further comprising:

2   determining the proper index address by determining the fetch bundle

3   address the branch instruction would have used if a prior branch

4   instruction in the previous set of instructions had not been

5   mispredicted.

1 21. The tool of claim 16, wherein the branch prediction scheme is for predicting an

2 outcome of a branch instruction.

1 22. The tool of claim 16 further comprising:

2   an entry in a branch prediction structure indexed by the index address.

1 23. The tool of claim 18, wherein the fetch bundle address is an address of a first

2 instruction in the plurality of fetched individual instructions.

1 24. The tool of claim 16, wherein the plurality of fetched individual instructions is an

2 instruction fetch bundle.

1   25.   The tool of claim 16, further comprising:

2   decode information for the individual instruction,

3   wherein the decode information is used to determine whether the

4   individual instruction is a branch instruction.

1   26.   The tool of claim 16, further comprising:

2   pre-decode information for the individual instruction,

3   wherein the pre-decode information is used to determine whether the

4   individual instruction is a branch instruction.

1   27.   A tool of improving branch prediction accuracy, comprising:

2   a set of instructions having an assigned address; and

3   a branch predictor for making a prediction for a branch instruction in the

4   set of instructions using the assigned address,

5   wherein the assigned address for the branch instruction in the set of

6   instructions is retained.

1   28.   The tool of claim 27 wherein the assigned address is a fetch bundle address.

1   29.   The tool of claim 27, wherein the branch predictor is further for making a

2   prediction for another branch instruction in the set of instructions using the

3   assigned address, wherein the assigned address for the other branch instruction in

4   the set of instructions is retained.

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1   30.   The tool of claim 29, wherein the branch instruction is mispredicted, the tool

2   further comprising:

3   a second set of instructions having a second assigned address, and

4   an instruction fetch unit for

5   removing the set of instructions having the assigned address; and

6   recognizes a branch instruction in the second set of instruction as a

7   branch instruction in the removed set of instructions,

8   wherein makes a prediction for the recognized branch instruction using the

9   assigned address of the removed set of instructions.

1   31.   The tool of claim 27 wherein the prediction made is a prediction of an outcome of

2   the branch instruction.

1   32.   An apparatus for improving prediction accuracy of a branch instruction scheme,

2   comprising:

3   means for reading an individual instruction in a current set of instructions;

4   means for fetching the individual instruction when an instruction fetch unit

5   determines that the individual instruction is valid; and

6   means for allowing the instruction fetch unit to use an index address for

7   the fetched individual instruction.

1   33.   An apparatus for improving branch prediction accuracy, comprising:

2   means for receiving a set of instructions having an assigned address;

3   means for predicting an outcome for a branch instruction in the set of

4   instructions using the assigned address; and

5   means for retaining the assigned address for the branch instruction in the

6   set of instructions.